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# TEST REPORT ON COMPRESSIVE STRENGTH OF CONCRETE CUBES

| | |
|---|---|
| Project | Improvement to Drains and Asphalting to Roads at Sadiq Layout Main Road and cross Road in Ward No.06(Thanisandra), Byatarayanapura Sub Division |
| Client | Bruhat Bangalore Mahanagar Palike |
| Consultant | TEJUS CONSULTANTS |
| Contractor | Benaka Developers & Project Pvt.Ltd. |
| Grade of concrete: | M20 |
| Size of cube: | 150x150x150 mm |
| Reference IS code: | IS:516-1959 |

| Sl.No. | Date of Casting | Date of testing | Age of Test | Weight of Cube | Area of Cube | Failure load | Compressive strength | Avg. Compressive strength |
|---|---|---|---|---|---|---|---|---|
| | | | | Kg | $mm^2$ | KN | $N/mm^2$ | $N/mm^2$ |
| 1 | 03.12.2019 | 31.12.2019 | 28 days | 8.130 | 22500 | 428 | 19.02 | 19.02 |
| 2 | 03.12.2020 | 31.12.2020 | 28 days | 8.138 | 22500 | 429 | 19.07 | |
| 3 | 03.12.2021 | 31.12.2021 | 28 days | 8.146 | 22500 | 427 | 18.98 | |

Note:
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2. The results indicated above are based on the tests carried out on the samples received in the laboratory/Site.
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# AGGREGATE IMPACT VALUE
## (IS: 2386 Part - 4)

| | |
|---|---|
| | Improvement to Drains and Asphalting to Roads at Sadiq Layout Main Road and cross Road in Ward No.06(Thanisandra), Byatarayanapura Sub Division |
| | Bruhat Bengaluru Mahanagara Palike |
| | TEJUS CONSULTANTS Basaveshwar Nagar Bangalore |
| | Benaka Developers & Project Pvt.Ltd. |
| Proposed Use | WMM |
| Sample Location | At plant |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | Date of Sampling | 16.01.2020 | | |
| | | | Date of Testing | 16.01.2020 | | |
| No. | Description | | Test No. | | | Spec Limit (%) |
| | | | 1 | 2 | 3 | |
| 1 | Wt. of stone pieces (dry) passing IS Sieve 12.5mm but retained in IS sieve 10mm (gm) | (Wa) | 357.00 | 355.00 | 330.00 | |
| 2 | Wt. of the fraction retained in IS sieve 2.36mm after the impact test (gm) | (Wb) | 277.00 | 269.00 | 251.00 | |
| 3 | Wt. of the fraction passed in IS sieve 2.36mm after the impact test (gm) | (Wc) | 80.00 | 86.00 | 79.00 | |
| 4 | Aggregate Impact Value (%) | (Wc/Wa)*100 | 22.41 | 24.23 | 23.94 | |
| 5 | Average Aggregate impact value | (%) | 23.52 | | | Max - 30 % |

Remarks :

Satisfactory / Not Satisfactory

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# FLAKINESS AND ELONGATION INDICES (IS 2386, PART 1)

| | |
|---|---|
| Project | Improvement to Drains and Asphalting to Roads at Sadiq Layout Main Road and cross Road in Ward No.06(Thanisandra), Byatarayanapura Sub Division |
| Client | Bruhat Bengaluru Mahanagara Palike |
| Consultant | TEJUS CONSULTANTS Basaveshwar Nagar Bangalore |
| Contractor | Benaka Developers & Project Pvt.Ltd. |

| | | | |
|---|---|---|---|
| Type of Material | WMM | Proposed Use | WMM |
| Sample Location | At plant | Date of Sampling | 16.01.2020 |
| | | Date of Testing | 16.01.2020 |

| Size of aggregate | | Flakiness Index | | Elongation Index | |
|---|---|---|---|---|---|
| Passing through IS sieve, mm | Retained on IS sieve, mm | Total wt. of aggregate retained on sieves (A) gms. | Wt. of aggregate passing from Flakiness gauge (B) gms | Wt. of aggregate retained on Flakiness gauge (C) gms | Wt. of aggregate retained on Elongation gauge after retained on Flakiness gauge(D)gms |
| 63.0 | 50.0 | 0 | 0 | 0 | 0 |
| 50.0 | 40.0 | 0 | 0 | 0 | 0 |
| 40.0 | 31.5 | 0 | 0 | 0 | 0 |
| 31.5 | 25.0 | 0 | 0 | 0 | 0 |
| 25.0 | 20.0 | 0 | 0 | 0 | 0 |
| 20.0 | 16.0 | 620 | 85 | 523 | 81 |
| 16.0 | 12.5 | 1117 | 114 | 1005 | 117 |
| 12.5 | 10.0 | 769 | 62 | 721 | 55 |
| 10.0 | 6.3 | 620 | 60 | 559 | 41 |
| Total | | 3126 | 321 | 2808 | 294 |

Note: Minimum 200 Pes should be taken on each fraction of test

| | |
|---|---|
| Flakiness Index(%): | 10.27 |
| Elongation Index(%): | 10.47 |
| Combined FI+EL (%) | 20.74 |

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Quality Control Representative

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# GRADATION FOR WMM
## (As per MORT&H 400-11)

| | | |
|---|---|---|
| Name of Work | : | Improvement to Drains and Asphalting to Roads at Sadiq Layout Main Road and cross Road in Ward No.06(Thanisandra), Byatarayanapura Sub Division |
| Client | : | Bruhat Bengaluru Mahanagara Palike |
| Consultant | : | TEJUS CONSULTANTS Basaveshwar Nagar Bangalore |
| Contractor | : | Benaka Developers & Project Pvt.Ltd. |
| Date of Testing | : | 16.01.2020 |
| Type of Mix | : | WMM |
| Sample I/D | : | WMM 2 |

| | | | |
|---|---|---|---|
| Sample Location: | At plant | Date of Sampling: | 16.01.2020 |
| | | Date of testing: | 16.01.2020 |
| Type of material & Purpose: | WMM | Oven Dry Wt.(gms): | 10000.0 |

| IS Sieve size in mm | Weight retained | Cummulative weight retained (gm) | Cummulative % of retained | Cummulative % of passing | Specification limits |
|---|---|---|---|---|---|
| 53 | 0 | 0 | 0.00 | 100.00 | 100.00 |
| 45 | 380 | 380 | 3.80 | 96.20 | 95-100 |
| 22.4 | 2411 | 2791 | 27.91 | 72.09 | 60-80 |
| 11.2 | 2516 | 5307 | 53.07 | 46.93 | 40-60 |
| 4.75 | 1429.0 | 6736 | 67.36 | 32.64 | 25-40 |
| 2.36 | 893.0 | 7629 | 76.29 | 23.71 | 15-30 |
| 0.6 | 811.0 | 8440 | 84.40 | 15.60 | 8.0-22.0 |
| 0.075 | 941.0 | 9381 | 93.81 | 6.19 | 0-8 |
| Pan | 616.0 | 9997 | | | |
| Total | 9997.0 | | | | |

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Consultant's Representative

TEJUS CONSULTANTS
No. 58, 3rd main, 6th Cross, 1st Stage, Basaveshwar Nagar, Bangalore

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## Field Dry Density test by Sand Replacement Method (As per IS 2720 (Part 28)

| | | | |
|---|---|---|---|
| Project | Improvement to Drains and Asphalting to Roads at Sadiq Layout Main Road and cross Road in Ward No.06(Thanisandra), Byatarayanapura Sub Division | | |
| Client | BRUHAT BANGALORE MAHANAGARA PALIKE | | |
| Consultant | M/s Tejus Consultants | | |
| Contractor | Benaka Developers & Project Pvt.Ltd. | | |
| Date of Testing | 16.01.2020 | | |
| Layer no. or level | WMM I layer | | |
| Depth of hole | 250mm | | |
| Field density: | 1 | 2 | 3 |
| Wt. of wet material from hole (Ww) gms. | 6161 | 6112 | 6234 |
| Wt. of sand+cylinder before pouring (w1) gms. | 14000 | 14000 | 14000 |
| Wt. of sand+cylinder after pouring (w2) gms. | 9736 | 9733 | 9704 |
| Wt. of sand in cone (w3) gms. | 835 | 842 | 830 |
| Wt. of sand in hole (w4)=(w1-w2-w3) gms. | 3429 | 3425 | 3466 |
| Bulk density of sand (γs)gm/cc | 1.31 | 1.32 | 1.31 |
| Bulk density of material(i.e. wt. of the wet material) (γb)=(Ww/w4*(γs))gm/cc | 2.35 | 2.36 | 2.36 |
| Moisture meter reading(moisture content) | 12.45 | 12.56 | 12.57 |
| Result | | | |
| FDD(Wt.of the dry material)=(100γb/100+mc)gm/cc | 2.09 | 2.09 | 2.09 |
| MDD | 2.13 | 2.13 | 2.13 |
| OMC | 12.60% | 12.60% | 12.60% |
| % of Compaction Obtained | 98.27 | 98.25 | 98.27 |
| Compaction Required | 98% | 98% | 98% |

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# GRADATION FOR WMM
## (As per MORT&H 400-11)

| | | |
|---|---|---|
| Name of Work | : | Improvement to Drains and Asphalting to Roads at Sadiq Layout Main Road and cross Road in Ward No.06(Thanisandra), Byatarayanapura Sub Division |
| Client | : | Bruhat Bengaluru Mahanagara Palike |
| Consultant | : | TEJUS CONSULTANTS Basaveshwar Nagar Bangalore |
| Contractor | : | Benaka Developers & Project Pvt.Ltd. |
| Date of Testing | : | 16.01.2020 |
| Type of Mix | : | WMM |
| Sample I/D | : | WMM 2 |

| | | | |
|---|---|---|---|
| Sample Location: | At plant | Date of Sampling: | 16.01.2020 |
| Type of material & Purpose: | WMM | Date of testing: | 16.01.2020 |
| | | Oven Dry Wt.(gms): | 10000.0 |

| IS Sieve size in mm | Weight retained | Cummulative weight retained (gm) | Cummulative % of retained | Cummulative % of passing | Specification limits |
|---|---|---|---|---|---|
| 53 | 0 | 0 | 0.00 | 100.00 | 100.00 |
| 45 | 378 | 378 | 3.78 | 96.22 | 95-100 |
| 22.4 | 2407 | 2785 | 27.85 | 72.15 | 60-80 |
| 11.2 | 2517 | 5302 | 53.02 | 46.98 | 40-60 |
| 4.75 | 1428.0 | 6730 | 67.30 | 32.70 | 25-40 |
| 2.36 | 897.0 | 7627 | 76.27 | 23.73 | 15-30 |
| 0.6 | 806.0 | 8433 | 84.33 | 15.67 | 8.0-22.0 |
| 0.075 | 931.0 | 9364 | 93.64 | 6.36 | 0-8 |
| Pan | 636.0 | 10000 | | | |
| Total | 10000.0 | | | | |

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3. Any Query regarding the report must be reported reported within 7 days from the date of testing.

Consultant's Representative

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## Test Report on Cement

| | |
|---|---|
| roject | Improvement to Drains and Asphalting to Roads at Sadiq Layout Main Road and cross Road in Ward No.06(Thanisandra), Byatarayanapura Sub Division |
| lient | Bruhat Bangalore Mahanagar Palike |
| onsultant | TEJUS CONSULTANTS |
| ontractor | Benaka Developers & Project Pvt.Ltd. |
| ample ID | Cement |
| ate of Sample ested | 22.11.2020 |
| ample pplied By | Agency |

| Sl.No. | Descriptions | Test Method as per IS | Test Result | Requirements as per IS: 12269-1987 |
|---|---|---|---|---|
| 1 | a) Initial Setting Time | IS-4031 (Part-5) | 33 Minutes | Not Less than 30 Minutes |
| | b) Final Setting Time | IS-4031 (Part-5) | 361 Minutes | Not More than 600 Minutes |
| 2 | Soundness | IS-4031 (Part-3) By the Le-Chatelier method | 5mm | Not More than 10 mm |
| 3 | Standard Consistency | IS-4031 (Part-4) | 29.00% | 25 % to 35 |

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# TEST REPORT

| | |
|---|---|
| Clients | BRUHAT BENGALORE MAHANAGARA PALIKE |
| Project | Improvement to Drains and Asphalting to Roads at Sadiq Layout Main Road and cross Road in Ward No.06(Thanisandra), Byatarayanapura Sub Division |
| Consultants | TEJUS CONSULTANTS Basaveshwar Nagar Bangalore |
| Contractor | Benaka Developers & Project Pvt.Ltd. |

## SPECIFIC GRAVITY AND WATER ABSORPTION

### FINE AGGREGATE (IS-2386-PART-3)

| | | | |
|---|---|---|---|
| Type of Material | Fine aggregate (River Sand/ M sand) | Proposed Use | PCC |
| Location/Source | At Site/Plant | Date of Sampling | 22.11.2019 |
| Period of Soaking | 24 hours | Date of Testing | 22.11.2019 |

| Sl. No. | Test Property | TRIAL - 1 | TRIAL - 2 | TRIAL - 3 | |
|---|---|---|---|---|---|
| A | Weight of sturated surface dry sample gm. | 664 | 635 | 672 | |
| B | Weight of oven - dry sample gm. | 654 | 630 | 660 | |
| C | Weight of Pycnometer Filled with water gm | 1275 | 1275 | 1275 | |
| D | Weight of Pycnometer + sample + water gm | 1686 | 1686 | 1698 | |
| E | Bulk specific gravity B / ( C + A - D ) | 2.585 | 2.813 | 2.651 | 2.683 |
| G | Absorption (%) ( A - B ) *100 / B | 1.529 | 0.794 | 1.818 | 1.380 |

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ಸಹಾಯಕ ಆಧಿಯಂತರರು
ಬಿಬಿಎಂಪಿ ಬ್ಯಾಟರಾಯನಪುರ ಉಪ ವಿಭಾಗ

ಸಹಾಯಕ ಕಾರ್ಯಪಾಲಕ ಆಧಿಯಂತರರು
ಬ್ಯಾಟರಾಯನಪುರ ಉಪ ವಿಭಾಗ
ಬಿಬಿಎಂಪಿ, ಬೆಂಗಳೂರು-26

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# TEST REPORT

| | |
|---|---|
| Clients | Bruhath Bangalore Mahanagara Palike |
| Project | Improvement to Drains and Asphalting to Roads at Sadiq Layout Main Road and cross Road in Ward No.06(Thanisandra), Byatarayanapura Sub Division |
| Consultants | TEJUS CONSULTANTS Basaveshwar Nagar Bangalore |
| Contractor | Benaka Developers & Project Pvt.Ltd. |
| Total Weight in gm: | 3000 |

## SIEVE ANALYSIS

| | | | |
|---|---|---|---|
| Type of Material | 40 mm down size | Proposed Use | PCC |
| Sample Location | At Site/Plant | Date of Sampling | 22.11.2019 |
| | | Date of Testing | 22.11.2019 |

| IS Sieve Size | Weight Retained in gm | Cum. Weight Retained in gm | Cumulative Weight Retained in % | Cumulative Weight Passing in % | Specific Limits as per IS 383-1970 (RA-2007) % of Passing For Graded Aggregate of Nominal Size |
|---|---|---|---|---|---|
| 80.00mm | 0 | 0 | 0.00 | 100.00 | 100 |
| 63.00mm | 0 | 0 | 0.00 | 100.00 | - |
| 40.00mm | 90 | 90 | 3.00 | 97.00 | 95-100 |
| 20.00mm | 1410 | 1500 | 50.00 | 50.00 | 30-70 |
| 10.00mm | 980 | 2480 | 82.67 | 17.33 | 10-35 |
| 4.75mm | 460 | 2940 | 98.00 | 2.00 | 0-5 |
| Pan | 60 | 3000 | 100.00 | 0.00 | |

Remarks : Satisfactory / Not Satisfactory

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ಬಿಬಿಎಂಪಿ ದಾಸರಹಳ್ಳಿ ಉಪ ವಿಭಾಗ

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ದಾಸರಹಳ್ಳಿ ಉಪ ವಿಭಾಗ
ಬಿಬಿಎಂಪಿ ಬೆಂಗಳೂರು

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|---|---|
| ect | Improvement to Drains and Asphalting to Roads at Sadiq Layout Main Road and cross Road in Ward No.06(Thanisandra), Byatarayanapura Sub Division |
| nt | Bruhat Bengaluru Mahanagara Palike |
| sultant | TEJUS CONSULTANTS Basaveshwar Nagar Bangalore |
| ractor | Benaka Developers & Project Pvt.Ltd. |

## AGGREGATE IMPACT VALUE (IS: 2386 Part - 4)

| | | | |
|---|---|---|---|
| osed Use | BC | **Date of Sampling** | 03.02.2020 |
| ple Location | At plant | **Date of Testing** | 03.02.2020 |

| No. | Description | | Test No. 1 | Test No. 2 | Test No. 3 | Spec Limit (%) |
|---|---|---|---|---|---|---|
| | Wt. of stone pieces (dry) passing IS Sieve 12.5mm but retained in IS sieve 10mm (gm) | (Wa) | 391.00 | 397.00 | 381.00 | |
| | Wt. of the fraction retained in IS sieve 2.36mm after the impact test (gm) | (Wb) | 299.00 | 292.00 | 296.00 | |
| | Wt. of the fraction passed in IS sieve 2.36mm after the impact test (gm) | (Wc) | 92.00 | 105.00 | 85.00 | |
| | Aggregate Impact Value (%) | (Wc/Wa)*100 | 23.53 | 26.45 | 22.31 | |
| | Average Aggregate impact value | (%) | 24.10 | | | Max - 30 % |

rks : ✓ Satisfactory / Not Satisfactory

Consultant's Representative

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| | |
|---|---|
| ct | Improvement to Drains and Asphalting to Roads at Sadiq Layout Main Road and cross Road in Ward No.06(Thanisandra), Byatarayanapura Sub Division |
| t | Bruhat Bengaluru Mahanagara Palike |
| ultant | TEJUS CONSULTANTS Basaveshwar Nagar Bangalore |
| ractor | Benaka Developers & Project Pvt.Ltd. |

## AGGREGATE IMPACT VALUE (IS: 2386 Part - 4)

| | | | |
|---|---|---|---|
| posed Use | BC | **Date of Sampling** | **03.02.2020** |
| ple Location | At plant | **Date of Testing** | **03.02.2020** |

| No. | Description | | Test No. 1 | Test No. 2 | Test No. 3 | Spec Limit (%) |
|---|---|---|---|---|---|---|
| 1 | Wt. of stone pieces (dry) passing IS Sieve 12.5mm but retained in IS sieve 10mm (gm) | (Wa) | 359.00 | 363.00 | 387.00 | |
| 2 | Wt. of the fraction retained in IS sieve 2.36mm after the impact test (gm) | (Wb) | 276.00 | 269.00 | 289.00 | |
| 3 | Wt. of the fraction passed in IS sieve 2.36mm after the impact test (gm) | (Wc) | 83.00 | 94.00 | 98.00 | |
| 4 | Aggregate Impact Value (%) | (Wc/Wa)*100 | 23.12 | 25.90 | 25.32 | |
| 5 | Average Aggregate impact value | (%) | 24.78 | | | Max - 30 % |

marks : ✓ Satisfactory / Not Satisfactory

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| | |
|---|---|
| Project | Improvement to Drains and Asphalting to Roads at Sadiq Layout Main Road and cross Road in Ward No.06(Thanisandra), Byatarayanapura Sub Division |
| Client | Bruhat Bengaluru Mahanagara Palike |
| Consultant | TEJUS CONSULTANTS Basaveshwar Nagar Bangalore |
| Contractor | Benaka Developers & Project Pvt.Ltd. |

## FLAKINESS AND ELONGATION INDICES (IS 2386, PART 1)

| | | | |
|---|---|---|---|
| Type of Material | BC | Proposed Use | BC |
| Sample Location | At plant | Date of Sampling | 03.02.2020 |
| | | Date of Testing | 03.02.2020 |

| Size of aggregate | | Flakiness Index | | Elongation Index | |
|---|---|---|---|---|---|
| Passing through IS sieve, mm | Retained on IS sieve, mm | Total wt. of aggregate retained on sieves (A) gms. | Wt. of aggregate passing from Flakiness gauge (B) gms | Wt. of aggregate retained on Flakiness gauge (C) gms | Wt. of aggregate retained on Elongation gauge after retained on Flakiness gauge(D)gms |
| 63 | 50 | 0 | 0 | 0 | 0 |
| 50 | 40 | 0 | 0 | 0 | 0 |
| 40 | 31.5 | 0 | 0 | 0 | 0 |
| 31.5 | 25 | 0 | 0 | 0 | 0 |
| 25 | 20 | 0 | 0 | 0 | 0 |
| 20 | 16 | 957 | 121 | 843 | 84 |
| 16 | 12.5 | 1119 | 75 | 1049 | 123 |
| 12.5 | 10 | 673 | 83 | 601 | 55 |
| 10 | 6.3 | 591 | 64 | 523 | 52 |
| Total | | 3340 | 343 | 3016 | 314 |

Note: Minimum 200 Pcs should be taken on each fraction of test

| | |
|---|---|
| Flakiness Index(%): | 10.27 |
| Elongation Index(%): | 10.41 |
| Combined FI+EL (%) | 20.68 |



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|---|---|
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| Client | Bruhat Bengaluru Mahanagara Palike |
| Consultant | TEJUS CONSULTANTS Basaveshwar Nagar Bangalore |
| Contractor | Benaka Developers & Project Pvt.Ltd. |

## FLAKINESS AND ELONGATION INDICES (IS 2386, PART 1)

| | | | | |
|---|---|---|---|---|
| Type of Material | BC | | Proposed Use | BC |
| Sample Location | At plant | | Date of Sampling | 03.02.2020 |
| | | | Date of Testing | 03.02.2020 |

| Size of aggregate | | Flakiness Index | | Elongation Index | |
|---|---|---|---|---|---|
| Passing through IS sieve, mm | Retained on IS sieve, mm | Total wt. of aggregate retained on sieves (A) gms. | Wt. of aggregate passing from Flakiness gauge (B) gms | Wt. of aggregate retained on Flakiness gauge (C) gms | Wt. of aggregate retained on Elongation gauge after retained on Flakiness gauge(D)gms |
| 63.0 | 50.0 | 0 | 0 | 0 | 0 |
| 50.0 | 40.0 | 0 | 0 | 0 | 0 |
| 40.0 | 31.5 | 0 | 0 | 0 | 0 |
| 31.5 | 25.0 | 0 | 0 | 0 | 0 |
| 25.0 | 20.0 | 0 | 0 | 0 | 0 |
| 20.0 | 16.0 | 947 | 87 | 943 | 63 |
| 16.0 | 12.5 | 1307 | 123 | 1251 | 123 |
| 12.5 | 10.0 | 513 | 74 | 442 | 63 |
| 10.0 | 6.3 | 497 | 57 | 433 | 67 |
| Total | | 3264 | 341 | 3069 | 316 |

Note: Minimum 200 Pcs should be taken on each fraction of test

| | |
|---|---|
| Flakiness Index(%): | 10.45 |
| Elongation Index(%): | 10.30 |
| Combined FI+EI (%) | 20.74 |



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| | | |
|---|---|---|
| Name of Work | : | Improvement to Drains and Asphalting to Roads at Sadiq Layout Main Road and cross Road in Ward No.06(Thanisandra), Byatarayanapura Sub Division |
| Client | : | Bruhat Bengaluru Mahanagara Palike |
| Consultant | : | TEJUS CONSULTANTS Basaveshwar Nagar Bangalore |
| Contractor | : | Benaka Developers & Project Pvt.Ltd. |
| Date of Testing | : | 03.02.2020 |
| Type of Mix | : | BC |
| Sample I/D | : | BC1 |

## GRADATION FOR BC
(As per MORT&H 500-18,Grading-2)

| | | | |
|---|---|---|---|
| Sample Location: | At plant | Date of Sampling: | 03.02.2020 |
| | | Date of testing: | 03.02.2020 |
| Type of material & Purpose: | BC | Oven Dry Wt.(gms): | 1200.0 |

| IS Sieve size in mm | Weight retained | Cummulative weight retained (gm) | Cummulative % of retained | Cummulative % of passing | Specification limits |
|---|---|---|---|---|---|
| 19.00 | 0 | 0 | 0.00 | 100.00 | 100.00 |
| 13.20 | 97 | 97.0 | 8.08 | 91.92 | 79 - 100 |
| 9.50 | 85 | 182.0 | 15.17 | 84.83 | 71 - 95 |
| 4.75 | 211 | 393.0 | 32.75 | 67.25 | 53 - 71 |
| 2.360 | 152 | 545.0 | 45.42 | 54.58 | 42 - 58 |
| 1.180 | 141 | 686.0 | 57.17 | 42.83 | 34 - 48 |
| 0.600 | 131 | 817.0 | 68.08 | 31.92 | 26 - 38 |
| 0.300 | 92 | 909.0 | 75.75 | 24.25 | 18 - 28 |
| 0.150 | 78 | 987.0 | 82.25 | 17.75 | 12 - 20 |
| 0.075 | 119 | 1106.0 | 92.17 | 7.83 | 4 - 10 |
| Pan | 94.0 | 1200.0 | | | |
| Total | 1200.0 | | | | |

Consultant's Representative



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| | | |
|---|---|---|
| **Name of Work** | : | Improvement to Drains and Asphalting to Roads at Sadiq Layout Main Road and cross Road in Ward No.06(Thanisandra), Byatarayanapura Sub Division |
| **Client** | : | Bruhat Bengaluru Mahanagara Palike |
| **Consultant** | : | TEJUS CONSULTANTS Basaveshwar Nagar Bangalore |
| **Contractor** | : | Benaka Developers & Project Pvt.Ltd. |
| **Date of Testing** | : | 03.02.2020 |
| **Type of Mix** | : | BC |
| **Sample I/D** | : | BC2 |

## GRADATION FOR BC
(As per MORT&H 500-18,Grading-2)

| | | | |
|---|---|---|---|
| **Sample Location:** | At plant | Date of Sampling: | 03.02.2020 |
| | | Date of testing: | 03.02.2020 |
| Type of material & Purpose: | BC | Oven Dry Wt.(gms): | 1200.0 |

| IS Sieve size in mm | Weight retained | Cummulative weight retained (gm) | Cummulative % of retained | Cummulative % of passing | Specification limits |
|---|---|---|---|---|---|
| 19 | 0 | 0 | 0.00 | 100.00 | 100.00 |
| 13.20 | 89 | 89.0 | 7.42 | 92.58 | 79 - 100 |
| 9.50 | 119 | 208.0 | 17.33 | 82.67 | 71 - 95 |
| 4.75 | 243 | 451.0 | 37.58 | 62.42 | 53 - 71 |
| 2.360 | 175 | 626.0 | 52.17 | 47.83 | 42 - 58 |
| 1.180 | 111 | 737.0 | 61.42 | 38.58 | 34 - 48 |
| 0.600 | 115 | 852.0 | 71.00 | 29.00 | 26 - 38 |
| 0.300 | 97 | 949.0 | 79.08 | 20.92 | 18 - 28 |
| 0.150 | 75 | 1024.0 | 85.33 | 14.67 | 12 - 20 |
| 0.075 | 115 | 1139.0 | 94.92 | 5.08 | 4 - 10 |
| Pan | 61.0 | 1200.0 | | | |
| Total | 1200.0 | | | | |

Consultant's Representative

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| | | |
|---|---|---|
| Name of Work | : | Improvement to Drains and Asphalting to Roads at Sadiq Layout Main Road and cross Road in Ward No.06(Thanisandra), Byatarayanapura Sub Division |
| Client | : | Bruhat Bengaluru Mahanagara Palike |
| Consultant | : | TEJUS CONSULTANTS Basaveshwar Nagar Bangalore |
| Contractor | : | Benaka Developers & Project Pvt.Ltd. |
| Date of Testing | : | 03.02.2020 |
| Type of Mix | : | Tack coat |
| Sample I/D | : | 1 |

## DETERMINATION OF RATE OF SPREAD TACK COAT

| Determination | Unit | Test No | |
|---|---|---|---|
| | | 1 | 2 |
| Size of Plate (mxm) | Mt | 0.30 x .30 | 0.30 x .30 |
| Area of Plate (a) | Sq.mtr | 0.09 | 0.09 |
| Initial Wt of empty Plate (b) | Kg | 0.822 | 0.844 |
| Final weight of plate after application of tack Coat (c) | Kg | 0.846 | 0.867 |
| Weight of tack Coat (d=c-b) | Kg | 0.024 | 0.023 |
| Rate of spread of tack coat | Kg/sq.m | 0.267 | 0.256 |
| Average | Kg/sq.m | 0.261 | |
| Specified Limit | Kg/sq.m | **0.250 Kg/sq.m** | |

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| | | |
|---|---|---|
| **Name of Work** | : | Improvement to Drains and Asphalting to Roads at Sadiq Layout Main Road and cross Road in Ward No.06(Thanisandra), Byatarayanapura Sub Division |
| **Client** | : | Bruhat Bengaluru Mahanagara Palike |
| **Consultant** | : | TEJUS CONSULTANTS Basaveshwar Nagar Bangalore |
| **Contractor** | : | Benaka Developers & Project Pvt.Ltd. |
| **Date of Testing** | : | 03.02.2020 |
| **Type of Mix** | : | Tack coat |
| **Sample I/D** | : | 2 |

**DETERMINATION OF RATE OF SPREAD TACK COAT**

| **Determination** | **Unit** | **Test No** | |
|---|---|---|---|
| | | **1** | **2** |
| Size of Plate (mxm) | Mt | 0.30 x .30 | 0.30 x .30 |
| Area of Plate (a) | Sq.mtr | 0.09 | 0.09 |
| Initial Wt of empty Plate (b) | Kg | 0.792 | 0.780 |
| Final weight of plate after application of tack Coat (c) | Kg | 0.815 | 0.805 |
| Weight of tack Coat (d=c-b) | Kg | 0.023 | 0.025 |
| Rate of spread of tack coat | Kg/sq.m | 0.256 | 0.278 |
| Average | Kg/sq.m | 0.267 | |
| Specified Limit | Kg/sq.m | **0.250 Kg/sq.m** | |

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| | | |
|---|---|---|
| **Name of Work** | : | Improvement to Drains and Asphalting to Roads at Sadiq Layout Main Road and cross Road in Ward No.06(Thanisandra), Byatarayanapura Sub Division |
| **Client** | : | Bruhat Bengaluru Mahanagara Palike |
| **Consultant** | : | TEJUS CONSULTANTS Basaveshwar Nagar Bangalore |
| **Contractor** | : | Benaka Developers & Project Pvt.Ltd. |
| **Date of Testing** | : | 03.02.2020 |
| **Type of Mix** | : | Tack coat |
| **Sample I/D** | : | 2 |

**DETERMINATION OF RATE OF SPREAD TACK COAT**

| Determination | Unit | Test No | |
|---|---|---|---|
| | | 1 | 2 |
| Size of Plate (mxm) | Mt | 0.30 x .30 | 0.30 x .30 |
| Area of Plate (a) | Sq.mtr | 0.09 | 0.09 |
| Initial Wt of empty Plate (b) | Kg | 0.792 | 0.780 |
| Final weight of plate after application of tack Coat (c) | Kg | 0.815 | 0.805 |
| Weight of tack Coat (d=c-b) | Kg | 0.023 | 0.025 |
| Rate of spread of tack coat | Kg/sq.m | 0.256 | 0.278 |
| Average | Kg/sq.m | 0.267 | |
| Specified Limit | Kg/sq.m | **0.250 Kg/sq.m** | |

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# BITUMEN CONTENT AND GRADATION DETERMINATION OF BITUMINOUS CONCRETE MIX

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| | | |
|---|---|---|
| **Name of Work** | : | Improvement to Drains and Asphalting to Roads at Sadiq Layout Main Road and cross Road in Ward No.06(Thanisandra), Byatarayanapura Sub Division |
| **Client** | : | Bruhat Bengaluru Mahanagara Palike |
| **Consultant** | : | TEJUS CONSULTANTS Basaveshwar Nagar Bangalore |
| **Contractor** | : | Benaka Developers & Project Pvt.Ltd. |
| **Date of Testing** | : | 03.02.2020 |
| **Type of Mix** | : | BC |
| **Sample I/D** | : | BC1 |

## DETERMINATION OF BITUMEN CONTENT

| Description | Trail 1 | Trail 2 |
|---|---|---|
| 1. Weight of Mixture before extraction, g | 920 | 915 |
| 2. Weight of Mixture after extraction, g | 866 | 863 |
| 3. Weight of Bitumen | 54 | 52 |
| 4. Weight of filter paper before extraction, g | 2.00 | 2.05 |
| 5. Weight of filter paper after extraction, g | 4.10 | 4.05 |
| 6. Weight of fines, g | 2.10 | 2.00 |
| 7. Weight of Bitumen & fines | 56.10 | 54.00 |
| 8. Bitumen content in % | 6.10 | 5.90 |
| 9. Average Bitumen content in % | **6.00** | |
| 10. Minimum Bitumen content in % | **5.80** | |

## GRADATION FOR BC AFTER EXTRACTION

**(As per MORT&H 500-18,Grading-2)**

| | | | | |
|---|---|---|---|---|
| Sample Location: | At site | Date of Sampling: | 03.02.2020 | |
| | | Date of testing: | 03.02.2020 | |
| Type of material & Purpose | BC | Oven Dry Wt.(gms): | 866.0 | |

| IS Sieve size in mm | Weight retained | Cummulative weight retained (gm) | Cummulative % of retained | Cummulative % of passing | Specification limits |
|---|---|---|---|---|---|
| 19.00 | 0 | 0 | 0.00 | 100.00 | 100.00 |
| 13.20 | 91 | 91.0 | 10.51 | 89.49 | 79 - 100 |
| 9.50 | 133 | 208.0 | 24.02 | 75.98 | 71 - 95 |
| 4.75 | 93 | 293.0 | 33.83 | 66.17 | 53 - 71 |
| 2.360 | 141 | 435.0 | 50.23 | 49.77 | 42 - 58 |
| 1.180 | 119 | 532.0 | 61.43 | 38.57 | 34 - 48 |
| 0.600 | 77 | 609.0 | 70.32 | 29.68 | 26 - 38 |
| 0.300 | 63 | 672.0 | 77.60 | 22.40 | 18 - 28 |
| 0.150 | 58 | 730.0 | 84.30 | 15.70 | 12 - 20 |
| 0.075 | 97 | 827.0 | 95.50 | 4.50 | 4 - 10 |
| Pan | 39.0 | 866.0 | | | |
| Total | 866.0 | | | | |

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## BITUMEN CONTENT AND GRADATION DETERMINATION OF BITUMINOUS CONCRETE MIX

| | | |
|---|---|---|
| **Name of Work** | : | Improvement to Drains and Asphalting to Roads at Sadiq Layout Main Road and cross Road in Ward No.06(Thanisandra), Byatarayanapura Sub Division |
| **Client** | : | Bruhat Bengaluru Mahanagara Palike |
| **Consultant** | : | TEJUS CONSULTANTS Basaveshwar Nagar Bangalore |
| **Contractor** | : | Benaka Developers & Project Pvt.Ltd. |
| **Date of Testing** | : | 03.02.2020 |
| **Type of Mix** | : | BC |
| **Sample I/D** | : | BC2 |

### DETERMINATION OF BITUMEN CONTENT

| Description | Trail 1 | Trail 2 |
|---|---|---|
| 1. Weight of Mixture before extraction, g | 933 | 914 |
| 2. Weight of Mixture after extraction, g | 879 | 860 |
| 3. Weight of Bitumen | 54 | 54 |
| 4. Weight of filter paper before extraction, g | 2.00 | 2.15 |
| 5. Weight of filter paper after extraction, g | 4.10 | 4.00 |
| 6. Weight of fines, g | 2.10 | 1.85 |
| 7. Weight of Bitumen & fines | 56.10 | 55.85 |
| 8. Bitumen content in % | 6.01 | 6.11 |
| 9. Average Bitumen content in % | **6.06** | |
| 10. Minimum Bitumen content in % | **5.80** | |

### GRADATION FOR BC AFTER EXTRACTION

**(As per MORT&H 500-18,Grading-2)**

| | | | |
|---|---|---|---|
| Sample Location: | At site | Date of Sampling: | 03.02.2020 |
| | | Date of testing: | 03.02.2020 |
| Type of material & Purpose: | BC | Oven Dry Wt.(gms): | 879.0 |

| IS Sieve size in mm | Weight retained | Cummulative weight retained (gm) | Cummulative % of retained | Cummulative % of passing | Specification limits |
|---|---|---|---|---|---|
| 19.00 | 0 | 0 | 0.00 | 100.00 | 100.00 |
| 13.20 | 94 | 94.0 | 10.69 | 89.31 | 79 - 100 |
| 9.50 | 127 | 221.0 | 25.14 | 74.86 | 71 - 95 |
| 4.75 | 91 | 312.0 | 35.49 | 64.51 | 53 - 71 |
| 2.360 | 139 | 451.0 | 51.31 | 48.69 | 42 - 58 |
| 1.180 | 117 | 568.0 | 64.62 | 35.38 | 34 - 48 |
| 0.600 | 83 | 651.0 | 74.06 | 25.94 | 26 - 38 |
| 0.300 | 61 | 712.0 | 81.00 | 19.00 | 18 - 28 |
| 0.150 | 51 | 763.0 | 86.80 | 13.20 | 12 - 20 |
| 0.075 | 58 | 821.0 | 93.40 | 6.60 | 4 - 10 |
| Pan | 58 | 879.0 | | | |
| Total | 879 | | | | |

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# TEST REPORT

| | |
|---|---|
| Clients | Bruhat Bangalore Mahanagara Palike |
| Project | Improvement to Drains and Asphalting to Roads at Sadhu Layout Main Road and cross Road in Ward No.06(Thanisandra), Byatarayanapura Sub Division |
| Consultants | Tejus Consultants, Bangalore |
| Contractor | Benaka Developers & Project Pvt.Ltd. |

## SIEVE ANALYSIS

| | | | |
|---|---|---|---|
| Total Weight: | 3000 gms | | |
| Type of Material | Fine aggregate (River Sand/ M sand) | Proposed Use | concrete |
| Sample Location | At Site/Plant | Date of Sampling | 22.11.2019 |
| | | Date of Testing | 22.11.2019 |

| IS Sieve Size | Weight Retained | Cum. Weight Retained | Cum. % Retained | Cum. % Passing | Spec. Limit (%) Passing (Zone-II) |
|---|---|---|---|---|---|
| 10.00 mm | 0 | 0 | 0 | 100.00 | 100 |
| 4.75 mm | 215 | 215 | 7.17 | 92.83 | 90 - 100 |
| 2.36 mm | 315 | 530 | 17.67 | 82.33 | 75 - 100 |
| 1.18 mm | 415 | 945 | 31.50 | 68.50 | 55 - 90 |
| 0.600 mm | 490 | 1435 | 47.83 | 52.17 | 35 -59 |
| 0.300 mm | 745 | 2180 | 72.67 | 27.33 | 8-30 |
| 0.150 mm | 615 | 2795 | 93.17 | 6.83 | 0 - 10 |
| Pan | 205 | 3000 | | | - |
| | | | | | |

Remarks : ✓ Satisfactory / Not Satisfactory

Note:
1. The report shall not be reproduced, except in full, without the written approval of the laboratory.
2. The results indicated above are based on the tests carried out on the samples received in the laboratory/Site.
3. Any Query regarding the report must be reported reported within 15days from the date of testing.

Authorised Signatory



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